WFVA/NOKIA File Nos.: 944-3.112/NC19367US

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Re application of: S. Hamalainen, et al

Serial No.: 09/977,578 : Group Art Unit: 2665

Filed: 15 October 2001 : Examiner: Nguyen

For: **POWER CONTROL DURING COMPRESSED MODE**

MAIL STOP APPEAL BRIEFS - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

BRIEF FOR APPELLANT

Sir:

This is an appeal from an Official Action mailed 14 December 2005, made final, including an Advisory Action mailed 8 March 2006.

A Notice of Appeal was mailed on 13 April 2006 with a return receipt postcard. The Patent Office stamped and mailed the return receipt postcard back to applicant on 19 April 2006.

This Brief is being filed in triplicate with a fee in the amount of $500.00 in accordance with 37 CFR §1.17(c).

I. THE REAL PARTY IN INTEREST

The real party in interest is Nokia Corporation, a corporation duly organized and existing under the laws of Finland, and having a principal place of business at Keilalahdentie 4, FIN-02150, ESPOO, Finland.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

III. STATUS OF CLAIMS

Claims 1 - 33 are pending.

Claims 1, 2, 6-9, 11, 12 and 16-19 stand rejected, and are being appealed.

Dependent claims 3-5, 10, 13-15 and 20-33 are objected to but indicated to be allowable if amended to include the limitations from the base claim from which they depend and any intervening claims.

IV. STATUS OF AMENDMENTS

The response after final rejection mailed on 14 February 2006 was not entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

1. The Problem In The Art

Generally, in a mobile communication network, when a mobile terminal (or any UE for that matter) travels from one geographic area to another, the mobile telephone may have to be handed over during what is known as a handover procedure from one cell to another in a radio access network, or from one radio access network

to another radio access network. During the handover procedure, the mobile telephone needs to do measurements on other frequencies of certain parameters of one or more neighboring radio access networks to which it may soon be handed over. In order to do such handover measurements, some mobile terminals have dual receivers, one receiver for continuous transmission/reception with the radio access network in which it is presently operating, and another receiver for taking the measurements of the certain parameters of the neighboring radio access networks. However, since receivers are expensive, most mobile terminals have only one receiver. In one receiver mobile terminals, handover measurements need to be done by placing the mobile terminal in what is known as a compressed mode of operation, which is often also referred to as a slotted mode.

In particular, the compressed mode is needed when making measurements on another frequency in a CDMA system, or doing measurements in a GSM or other system while having a call going-on in a CDMA network, without a full dual receiver terminal. During the compressed mode of operation, the transmission and reception in the mobile terminal are halted for a short time, in the order of a few milliseconds, in order to perform the measurements on the other frequencies. In effect, transmission and reception are ceased for one or more slots in one or more communications frames. The

intention is not to lose data but to compress frames of the data transmission in the time domain, which opens a gap in one or more frames. Single and double frame methods for implementing the compressed mode of operation are known in the art. In one such method, the data rate is increased by changing the spreading factor, as described in WCDMA for UMTS, Radio Access for Third Generation Mobile Communications, edited by H. Holma et al., Wiley & Sons, Ltd. 2000. In order to transmit data at a higher rate, the power used for the data transmission must be increased in the compressed mode. After the gap, the power level must be readjusted for normal operation. However, the gap in a compressed frame distorts the closed loop power control of the mobile terminal. Such distortion further leads to increased frame error rate (FER) and block error rate (BLER). After the gap, transmission powers in the mobile terminal may be at the wrong levels, which can adversely affect the whole transmission time interval (TTI). This is the case especially for mobile terminals moving at moderate speeds in the radio access network.

In an attempt to address this problem, in the prior art a larger power control step is used after the gap to try to adjust the power to appropriate level as soon as possible. However, it may take several power control adjustments before power levels are

correct. During that time, data traffic being sent may be distorted.

The invention provides a solution to the aforementioned problem in the prior art.

2. The Claimed Solution

The present invention provides a new and unique method and apparatus for implementing a compressed mode of operation in a mobile communication network 10 (Figure 1) in which data transmission and reception in the user equipment 15 is ceased so required measurements can be done. The method and apparatus feature a step 44 (Figure 4) or a module 15j (Figure 8) for adjusting the power level of data transmission in the user equipment 15 to a correct power level before a subsequent data transmission is sent. In other words, transmission power is adjusted after the transmission/reception gap and before the subsequent data transmission is resumed. During the power adjustment, control channels may be sent, if necessary.

The compressed mode may be implemented using a single frame method shown in Figures 2A, 2B and 3, in which transmission is ceased, measurements are made and power levels are adjusted in slots in a single frame 30 (Figure 2A), 34 (Figure 2B). In this case,

control channels and power control commands are sent either in the last slots 11-14 (Figures 2A and 3) of the single frame 30 (Figure 2A), or in the intermediate slots 9-12 (Figure 2B) of the single frame 34 (Figure 2B). The single frame method is described in detail from page 8, line 7, to page 11, line 19 of the patent application.

Alternatively, the compressed mode may also be implemented using a double frame method shown in Figures 5A to 5D. In Figure 5a, transmission is ceased and measurements are made in one frame, e.g. in slots 8-14 in a first frame 50, and power levels are adjusted, e.g. in slots 0-7 in a second frame 52. In Figure 5B, transmission is ceased and measurements are made in inbetween frames, e.g. in slots 8-14 of a frame 56 and slots 0-2 of frame 58 and power levels are adjusted, e.g. in slots 3-10 in the second frame 58. In Figure 5C, transmission is ceased and measurements are made in one frame, e.g. in slots 5-12 in a first frame 57, and power levels are adjusted, e.g. in slots 13-14 of the first frame 57 and slots 0-2 of the second frame 59. In Figure 5D, transmission is ceased and measurements are made in one frame, e.g. in slots 8-14 in the second frame 56 and power levels are adjusted, e.g. in slots 8-14 of the second frame 56. The double frame method is described in

detail on page 11, line 21, through page 18, line 20 of the patent application.

Alternatively still, the compressed mode may be implemented using a triple frame method shown in Figure 5E, as described in the paragraph bridging pages 18-19 of the patent application.

In effect, in the present invention, no data traffic is sent after a compressed mode gap, instead only control channels and power control are active over this time period. This is done in order to adjust power levels after the gap to a correct level before sending any subsequent data. When power levels are adjusted to the correct level before any data is sent, this reduces the probability of frame error rate (FER) and block error rate (BLER) and thus improves overall system performance.

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The following is a concise statement of each ground of rejection presented for review:

The non-obviousness of claims 1, 2, 6, 11, 12 and 16 over the admitted prior art in view of Vukovic (United States Patent Application Publication No. US 2002/0198012 A1).

The non-obviousness of claims 7-9 and 17-19 over the admitted prior art in view of Vukovic as applied to claims 1, 6, 11 and 16,

and further in view of Tigerstedt (United States Patent No. 6,035,208).

VII. ARGUMENTS

A. INDEPENDENT CLAIMS 1 AND 11

The main independent claims 1 and 11 are rejected based on the proposed combination of the admitted prior art in view of Vukovic.

However, it is respectfully submitted that said remarks are overlooking the fact that neither the admitted prior art, Vukovic nor the proposed combination thereof even remotely suggests the whole thrust of the claimed invention, which is to adjust the power level of the data transmission in a compression mode of operation in the user equipment to a correct power level before a subsequent data transmission is sent, as claimed herein.

Clearly, the admitted prior art does not suggest such an adjustment of the power level of the data transmission in a compression mode of operation, especially to correct the power level before a subsequent data transmission is sent. The reasoning in the office Action appreciates this fact.

Moreover, Vukovic's MS 302 adjusts the power level of each access request until receiving an "ACK" or "NAK" back from the base station 306 in Figure 3, as set forth in paragraphs 21 to 23.

However, similar to the admitted prior art, this adjustment of the power level is not done during a compression mode of operation, especially to correct the power level before a subsequent data transmission is sent.

In view of this, both cited prior art references are missing two critical pieces of the claimed invention - one, to adjust the power level during a compression mode of operation, and two, to correct the power level before a subsequent data transmission is sent when in this mode.

It is respectfully submitted that since Vukovic does not make up for the fundamental deficiency in the teaching of the admitted prior art in this most important regard, the proposed combination thereof does not, and cannot, result in the claimed invention.

For all these reasons, it is respectfully submitted that the proposed combination of the cited prior art does not teach or suggest the claimed invention.

Response to Remarks in Paragraph 7 (Pages 14-17)

Moreover, paragraph 7 of the Office Action provides remarks in response to the points made in Applicants' October 5th response, which have been reviewed and are appreciated by the undersigned attorney. This is a reply to those remarks.

In paragraph 7 of the Final Rejection, the remarks on page 15, line 1 through page 16, line 2, are a repeat of the reasoning in paragraph 4 of the Final Rejection. In view of this, this reasoning has been fully responded to above which is not repeated herein.

In paragraph 7 of the Final Rejection, the remarks on page 17, lines 3-5, state that "applicant is directed to paragraph 0023, wherein the MS mobile station 302 and the base station 306 are able to determine an appropriate power level for a subsequent transmission of a message by the MS." In reply, it is respectfully submitted that as stated above Vukovic's MS 302 adjusts the power level of each access request until receiving an "ACK" or "NAK" back from the base station 306 in Figure 3, as set forth in paragraphs 21 to 23. However, similar to the admitted prior art, this adjustment of the power level is not done during a compression mode of operation, especially to correct the power level before a subsequent data transmission is sent, as claimed.

In paragraph 7 of the Final Rejection, the remarks on page 17, lines 6-10, state that "in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references." In reply, it is respectfully submitted that the reasoning by applicant is not interpreting the

cited prior art references individually, but is instead interpreting the cited prior art when viewed as a whole in combination. Because of this, it is respectfully submitted that, when the cited prior art is view as a whole in combination, the proposed combination of the admitted prior art in view of Vukovic does not suggest such an adjustment of the power level of the data transmission in a compression mode of operation, especially to correct the power level before a subsequent data transmission is sent, as claimed. Clearly, the whole thrust of the claimed invention is to adjust the power level of the data transmission in a compression mode of operation, especially to correct the power level before a subsequent data transmission is sent, which the cited prior art when viewed as a whole in combination clearly does not teach or suggest to do.

For all these additional reasons, it is respectfully submitted that the proposed combination of the cited prior art does not teach or suggest the claimed invention.

B. THE ALLOWABLE CLAIMS 3-5, 10, 13, 13-15 and 20-33

Dependent claims 3-5, 10, 14-15 and 20-33 are indicated to allowable if rewritten or amended to include the base claim and any intervening claims. In view of the remarks above, we do not believe that it is necessary to amend these claims. Moreover, claim 13 is

an independent claim that recites a specific embodiment of the invention and is indicated to be allowable.

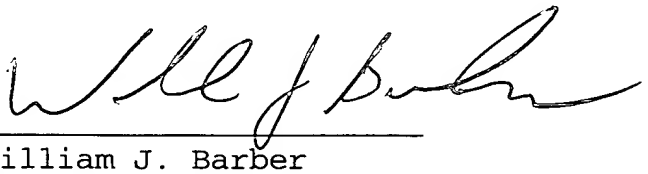
C. THE REMAINING DEPENDENT CLAIMS

The remaining rejected dependent claims depend directly or indirectly from claims 1 or 11, contain all the limitations thereof, and are deemed patentable over the proposed combination for the all the reasons set forth above in relation to the main independent claims 1 and 11. For example, Tigerstedt does not make up for the fundamental deficiency in teaching of the cited proposed combination of the admitted prior art and Vukovic.

D. CONCLUSION

In view of this, it is respectfully submitted that the reasoning in the rejection of these claims is in error, and should be reversed.

Respectfully submitted,



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WJB/dap
19 September 2006

IX. APPENDIX

The following claims are pending in the patent application:

1. (Original) A method of implementing a compressed mode of operation in a mobile communication network in which data transmission and reception in user equipment is ceased so a required measurement can be made, characterized in that

the power level of data transmission in the user equipment is adjusted to a correct power level before a subsequent data transmission is sent.

2. (Original) A method according to claim 1, characterized in that the compressed mode is implemented using a single frame method.

3. (Original) A method according to claim 2, characterized in that compressed mode data transmission is sent in beginning slots of the single frame, the data transmission and reception is ceased in intermediate slots of the single frame and one or more measurements are made during the transmission gap, and the control channels and power control commands are only sent in the remaining slots of the single frame to adjust the power level of the data transmission in the next frame to the correct level.

4. (Original) A method according to claim 1, characterized in that the compressed mode is implemented using a double frame method, and control channels and power control commands are sent in slots of a second frame.

5. (Original) A method according to claim 4, characterized in that compressed mode data transmission is sent in the beginning slots of a first frame, the data transmission and reception is ceased in the remaining slots of the first frame and measurements are made during the transmission gap, the control channels and power control commands are only sent in the beginning slots of the second frame to adjust the power level of the data transmission in the second frame to the correct level, and the subsequent data transmission is sent in the remaining slots of the second frame.

6. (Original) A method according to claim 1, characterized in that the method is implemented during a handover procedure.

7. (Original) A method according to claim 6, characterized in that the handover procedure is a hard handover.

8. (Original) A method according to claim 6, characterized in that the handover procedure is an intersystem handover between two wideband code division multiple access networks, a handover between frequency division duplex and time division duplex modes, or a handover between a wideband code division multiple access network and another network such as a GSM network.

9. (Original) A method according to claim 1, characterized in that the measurement is an inter-frequency measurement.

10. (Original) A method according to claim 9, characterized in that the measurement includes power level measurements, an initial synchronization measurements to a frequency correction channel and a synchronization channel, and tracking measurements of the frequency correction and synchronization channels and base station identity code decoding.

11. (Original) User equipment for a mobile communication network having a compressed mode module for implementing a compressed mode of operation in which data transmission and reception is ceased so a required measurement can be made, characterized in that

the user equipment includes an adjust power level module for adjusting the power level of data transmission to a correct power level before a subsequent data transmission is sent.

12. (Original) User equipment according to claim 11, characterized in that the compressed mode module implements the compressed mode using a single frame method.

13. (Original) User equipment according to claim 12, characterized in that

the user equipment has a handover module with the compressed mode module, a measurement module and an adjust power level module;

the compressed mode module sends compressed mode data transmission in the beginning slots of the single frame and ceases the data transmission and reception in the intermediate slots of the single frame;

the measurement module makes one or more measurements during the transmission gap; and

the adjust power level module only sends the control channels and power control commands are only sent in the remaining slots of the single frame to adjust the power level of the subsequent data transmission in the next frame.

14. (Original) User equipment according to claim 11, characterized in that

the compressed mode module implements the compressed mode using a double frame method, and control channels and power control commands are sent in slots of a second frame.

15. (Original) User equipment according to claim 14, characterized in that

the user equipment has a handover module with the compressed mode module, a measurement module and an adjust power level module;

the compressed mode module sends compressed mode data transmission in the beginning slots of a first frame and ceases the data transmission and reception in the remaining slots of the first frame;

the measurement module makes measurements during the transmission gap;

the adjust power level module only sends the control channels and power control commands in the beginning slots of the second frame to adjust the power level of the data transmission in the second frame to the correct level; and

the compressed mode module sends the subsequent data transmission in the remaining slots of the second frame.

16. (Original) User equipment according to claim 11, characterized in that the user equipment has a handover procedure module having the compressed module therein for implementing the compressed mode during a handover procedure.

17. (Original) User equipment according to claim 16, characterized in that the handover procedure is a hard handover.

18. (Original) User equipment according to claim 16, characterized in that the handover procedure is an intersystem handover between two wideband code division multiple access networks, a handover between frequency division duplex and time division duplex modes, or a handover between a wideband code division multiple access network and another network such as a GSM network.

19. (Original) User equipment according to claim 16, characterized in that the handover procedure module has a measurement module for making an inter-frequency measurement.

20. (Original) User equipment according to claim 19, characterized in that the measurement module makes power level measurements, initial synchronization measurements to a frequency correction channel and a synchronization channel, and tracking measurements of the frequency correction and synchronization channels and base station identity code decoding.

21. (Original) A method according to claim 1, characterized in that compressed mode data transmission is sent in the beginning slots of a first frame, the data transmission and reception is ceased in the remaining slots of the first frame and beginning slots of a second frame and measurements are made during this transmission gap, the control channels and power control commands are only sent in intermediate slots of the second frame to adjust the power level of the data transmission in the second frame to the correct level, and the subsequent data transmission is sent in the remaining slots of the second frame.

22. (Original) User equipment according to claim 11, characterized in that the user equipment has a handover module with the compressed mode module, a measurement module and an adjust power level module; the compressed mode module sends compressed mode data

transmission in the beginning slots of a first frame and ceases the data transmission and reception in the remaining slots of the first frame and beginning slots of a second frame; the measurement module makes measurements during this transmission gap; the adjust power level module sends only the control channels and power control commands in intermediate slots of the second frame to adjust the power level of the data transmission in the second frame to the correct level; and the compressed mode module sends the subsequent data transmission in the remaining slots of the second frame.

23. (Original) A method according to claim 1, characterized in that the compressed mode is implemented using a multiple frame method, and control channels and power control commands are sent in slots of a last frame.

24. (Original) User equipment according to claim 11, characterized in that the compressed mode module implements the compressed mode using a multiple frame method, and sends control channels and power control commands in slots of a last frame.

25. (Original) A method according to claim 2, characterized in that compressed mode data transmission is sent in beginning slots of

the single frame, the data transmission and reception is ceased in intermediate slots of the single frame and one or more measurements are made during the transmission gap, the control channels and power control commands are sent in the subsequent intermediate slots of the single frame to adjust the power level of the data transmission to the correct level and subsequent data transmission is sent in the remaining slots of the single frame.

26. (Original) A method according to claim 4, characterized in that compressed mode data transmission is sent in the beginning slots of a first frame, the data transmission and reception is ceased in the intermediate slots of the first frame and measurements are made during the transmission gap, the control channels and power control commands are sent in slots that overlap the first and second frames to adjust the power level of the data transmission in the second frame to the correct level, and the subsequent data transmission is sent in the remaining slots of the second frame.

27. (Original) A method according to claim 4, characterized in that compressed mode data transmission is sent in a first frame, the data transmission and reception is ceased in the beginning slots of the first frame and one or more measurements are made during the

transmission gap, and the control channels and power control commands are sent in remaining slots of the second frame to adjust the power level of the data transmission in the second frame to the correct level.

28. (Original) A method according to claim 2, characterized in that power control commands are sent in slots of the single frame.

29. (Original) A method according to claim 28, characterized in that control channel commands are also sent in slots of the single frame.

30. (Original) User equipment according to claim 12, characterized in that the compressed mode module sends power control commands in slots of the single frame.

31. (Original) User equipment according to claim 30, characterized in that the compressed mode module also sends control channel commands in slots of the single frame.

32. (Original) A method according to claim 1, characterized in that the compressed more is implemented with a method using three or more frames.

33. (Original) A method according to claim 32, characterized in that compressed data transmission is sent during a first frame and beginning slots of a second frame, transmission/reception cessation and measurements is performed in the remaining slots of the second frame and beginning slots of a third frame, and power level adjustment are performed in the remaining slots of the third frame.